User Manual

GOODWE DS SERIES

Ver 03

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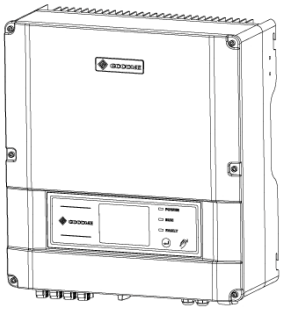
Note:
The images and diagrams in this manual are for guidance only. Please refer to the actual product.

1 Symbols

	Caution! - Failure to observe a warning indicated in this manual may result in injury.
	Danger of high voltage and electric shock!
	Danger of hot surface!
	Product should not be disposed as household waste.
	This side up; the package must always be transported, handled and stored in such a way that the arrows always point upwards.
	Components of the product can be recycled.
	Fragile; the package/product should be handled carefully and never be tipped over or slung.
	No more than six (6) identical packages may be stacked on each other.
	Keep dry; the package/product must be protected from excessive humidity and must be stored under cover.
	CE Mark
	Residual voltage exists in the inverter; before commencing any maintenance, at least 5 minutes must be allowed for the capacitor in the inverter to fully discharge.

Units：



3.6-4.6KW

2 Safety

The DS series inverter of Jiangsu GoodWe Power Supply Technology Co. Ltd. (hereinafter referred to as GoodWe) strictly conforms to related safety rules in design and test. Safety regulations relevant to the location shall be followed during installation, commissioning, operation and maintenance. Improper operation may have a risk of electric shock or damage to equipment and property.

- Installation, maintenance and connection of inverters must be performed by qualified personnel, in compliance with local electrical standards, regulations and the requirements of local power authorities and/or companies.
- To avoid electric shock, DC input and AC output of the inverter must be terminated at least 5 minutes before performing any installation or maintenance.

- The temperature of some parts of the inverter may exceed 60℃ during operation. To avoid being burnt, do not touch the inverter during operation. Let it cool before touching it.
- Ensure children are kept away from inverters.
- Do not open the front cover of the inverter. Apart from performing work at the wiring terminal (as instructed in this manual), touching or changing components without authorization may cause injury to people, damage to inverters and annulment of the warranty.
- Static electricity may damage electronic components. Appropriate method must be adopted to prevent such damage to the inverter; otherwise the inverter may be damaged and the warranty annulled.
- Ensure the output voltage of the proposed PV array is lower than the maximum rated input voltage of the inverter; otherwise the inverter may be damaged and the warranty annulled.
- When the photovoltaic array is exposed to light, it supplies a d.c. voltage to the PCE.
- PV modules should have an IEC61730 classA rating. If the maximum AC mains operating voltage is higher than the PV array maximum system voltage, PV modules should have a maximum system voltage rating based upon the AC mains voltage.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be

impaired.

- Completely isolate the equipment should ： switch off the DC switch ,disconnect the DC terminal ,and disconnect the AC terminal or AC breaker.
- Not to enter other areas of the equipment when maintaining!

3 Installation

3.1 Mounting Instruction

A For optimal performance, the inverter must be located where the ambient temperature is less than 45 °C.

B For convenience in maintenance and in checking the LCD display, install the inverter at eye level.

C Inverters should NOT be installed near flammable and/or explosive items. Any electro-magnetic equipment should be kept away from the installation site.

D The product label and warning symbol must be clearly visible after installation.

3.2 Unpacking

When you receive the GoodWe inverter, please check for external damage to the inverter and any accessories. Please also check that the following are included:

Inverter	1
Wall-mounted bracket	1
Lock Plate	1
Positive DC Plugs	4
Negative DC Plugs	4
AC Plug	1

USB Data Cable 1

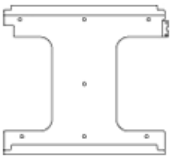
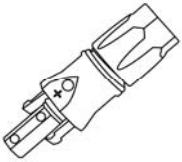
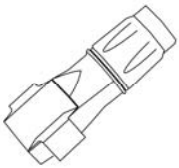
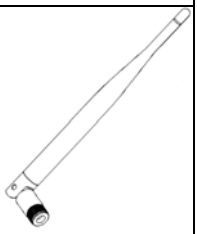
Expansion Bolts 7

Screws for Lock Plate and RS485 Cover 5

User Manual 1

Warranty Card 1

Antenna(only for WiFi inverter) 1

 Wall-mounted Bracket	 Positive DC Plug	 Negative DC Plug	Lock Plate
AC Plug	USB Data Cable	Expansion Bolt	Inverter
Flat Head Screw	User Manual	Warranty Card	 Antenna

3.3 Equipment Installation

3.3.1 Selecting the installation location

The following must be considered when selecting the best location for an inverter:

- The mount and installation method must be appropriate for the inverter's weight and dimensions.
- The location must be well ventilated and sheltered from direct sunlight.
- The inverter must be installed vertical or with a backward tilt less than 15°. No sideways tilt is allowed. The connection area must point downwards.

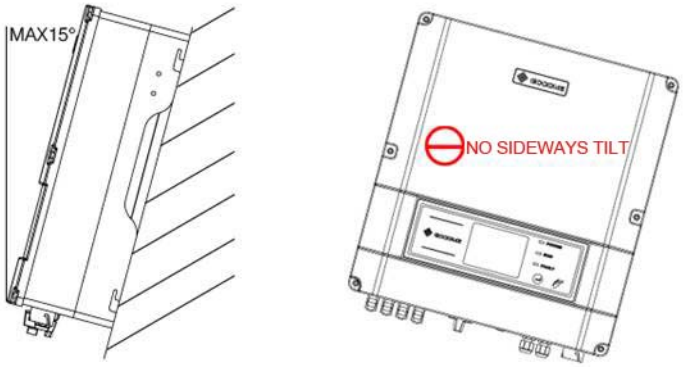


Figure 3.3.1-1

- To allow dissipation of heat, and for convenience of dismantling, clearances around the inverter must be at least:

  Upward 300mm
  Downward 500mm
  Front 300mm
  Both sides 200mm

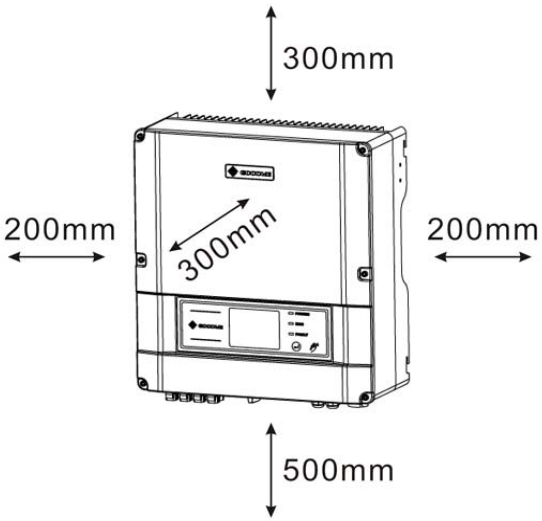


Figure 3.3.1-2

3.3.2 Mounting Procedure

A Use the wall-mounted bracket as a template and drill 7 holes in the wall, 10 mm in diameter and 80 mm deep.

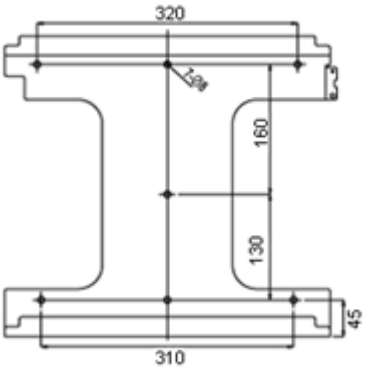


Figure 3.3.2-1

B Fix the wall mounting bracket on the wall using the expansion bolts in the accessories bag.

C Hold the inverter by the groove on the heat sink.

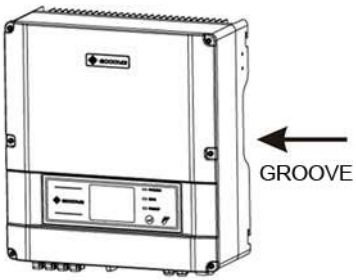


Figure 3.3.2-2

D Place the inverter on the wall-mounted bracket (as illustrated below).

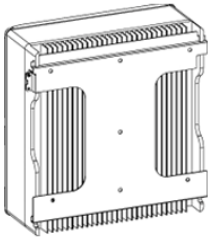


Figure 3.3.2-3

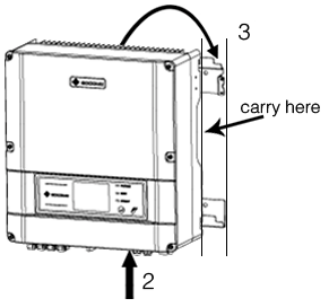


Figure 3.3.2-4

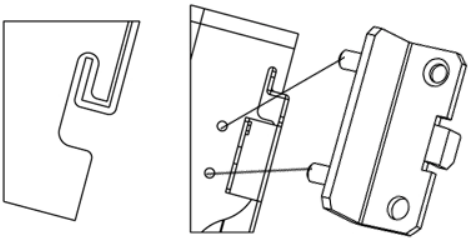


Figure 3.3.2-5

E Insert the lock plate pegs into the two holes in the heat-sink, then fix the inverter with a padlock and screw M3x8.

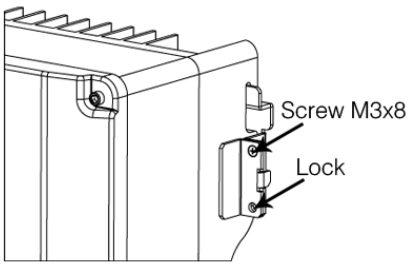


Figure 3.3.2-6

3.4 Electrical Connection

Connections must be made in compliance with local regulations and the requirements of local power authorities/companies.

In accordance with VDE0126-1-1/A1, the inverter incorporates a Residual Current Monitoring Unit (RCMU) which monitors residual current from the solar module to the grid side of the inverter. The inverter can automatically differentiate between fault current and normal capacitive leakage currents.

It must be included a breaker or a fuse at the AC side, ac breaker's norminal voltage is 400Vac, the melting current is not larger than 16A.

The equipment should have a protective earthing attached to earth conductor.

3.4.1 Connection to grid (AC side Connection)

A Check the grid (utility) voltage and frequency at the connection point of the inverter. It should be 230VAC (or 220VAC), 50/60Hz, and single phase.

B Disconnect the breaker or fuse between the PV inverter and the utility.

C Connect the inverter to the grid as follows:

- Switch off the AC breaker.
- Disassemble the female connector of the AC wire connector and connect the AC wires to the connection

socket as indicated.

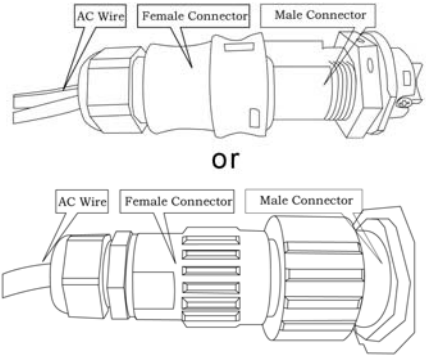


Figure 3.4.1-1

- Insert Line wire to Pin 1, Neutral wire to Pin 2 and Ground wire to Pin ⏚

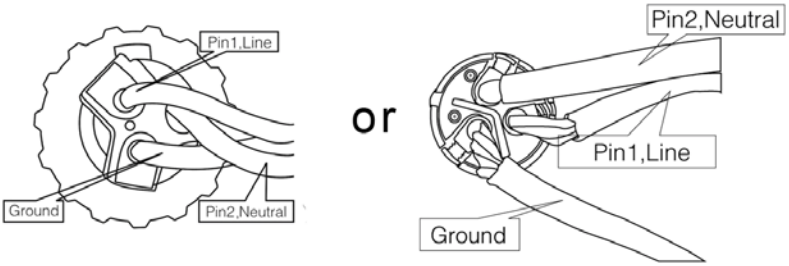


Figure 3.4.1-2

- Tighten the cables with a torque of 20kgf.cm (1.9 N.m).
- After fastening all screws, reassemble the female connector of the AC wire connector.
- Connect the female connector of the AC wire connector to the male connector on the inverter.

D Specifications of the AC wires:

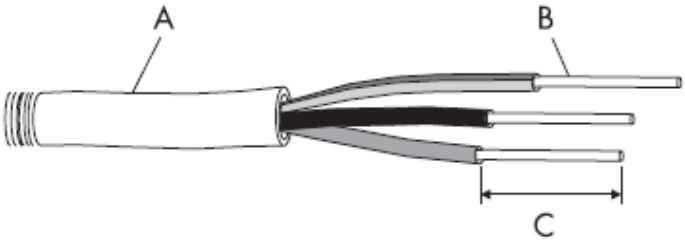


Figure 3.4.1-3

Depicted	Size
A External diameter of the wire	12mm-25mm
B Sectional area of conducting materials	Max.6mm^2
C Length of bare wire	Approx.10mm

E AC output connection

Tighten the screw with a screw driver until the head of the screw is inside the connector. Otherwise the wire could be loose.

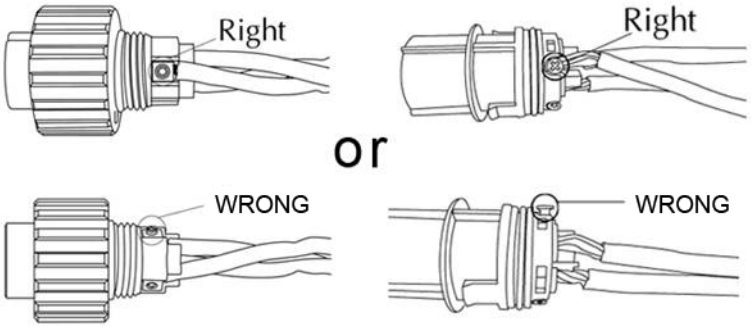


Figure 3.4.1-4

3.4.2 DC side connection

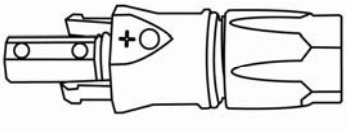
A Make sure the maximum open circuit voltage (Voc) of each PV string does not exceed the inverter's input voltage Vmax under any condition.

B Use Phoenix contact or Multi-contact connectors for the PV array terminals.

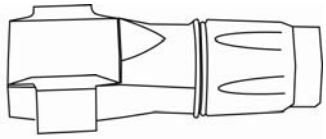
C Connect the positive and negative terminals of the PV panel to corresponding terminals on the inverter. The DC terminal on each inverter can bear 20A DC current.

Phoenix Contact Connectors

If using Phoenix contact connectors for the PV array terminals, install as follows:



Female side connector (PV+)



Male side connector (PV-)

Connectors must be installed as a pair, and each cable stripped and installed as shown below.

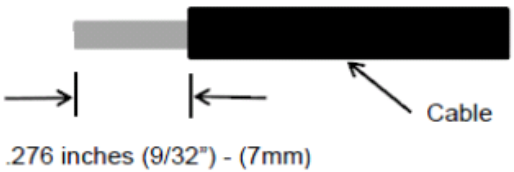


Figure 3.4.2-1

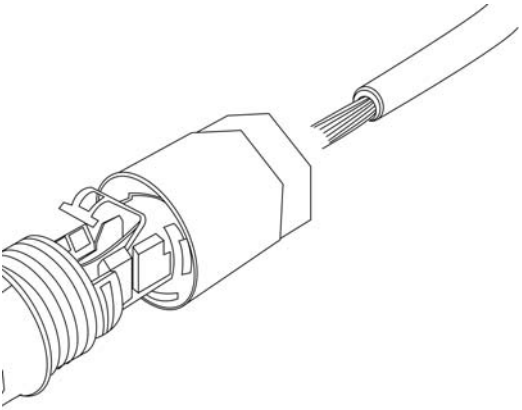


Figure 3.4.2-2

1. Insert the stripped PV conductor.

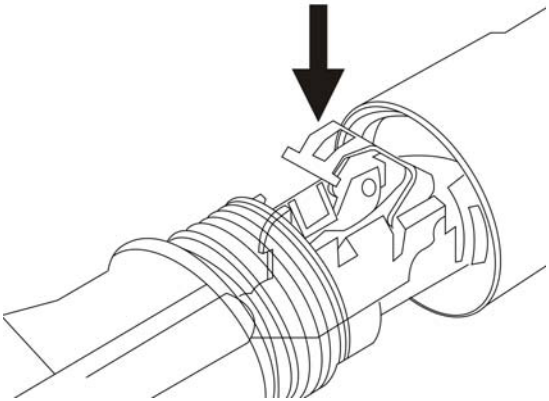


Figure 3.4.2-3

2. Press down on the spring and snap in.

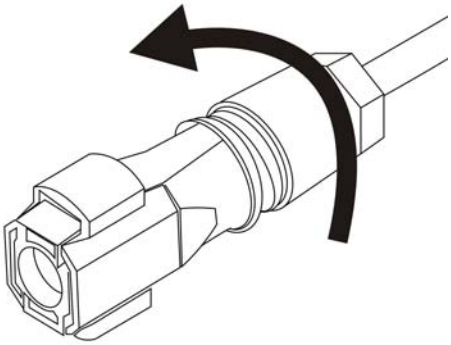


Figure 3.4.2-4

3.Tighten the screw connection. Then the terminal can be connected to the inverter side

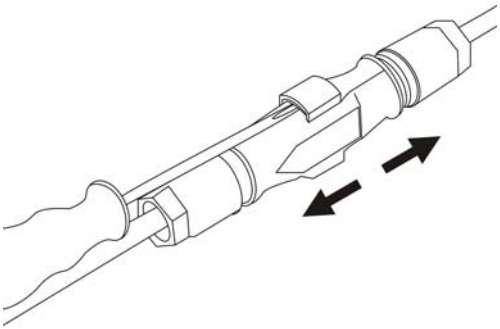
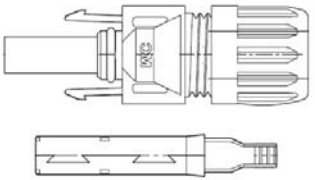


Figure 3.4.2-5

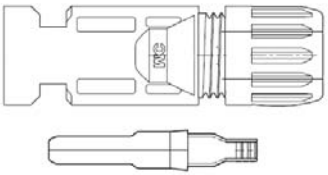
4. The connection can only be released using a screwdriver

Multi-Contact Connectors

If using Multi-contact connectors for the PV array terminals, install as follows:

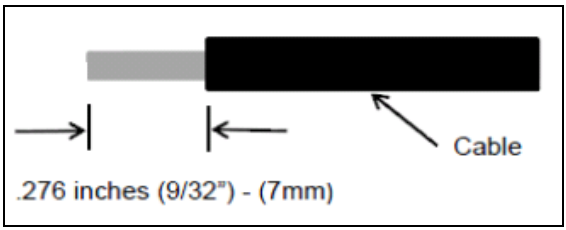


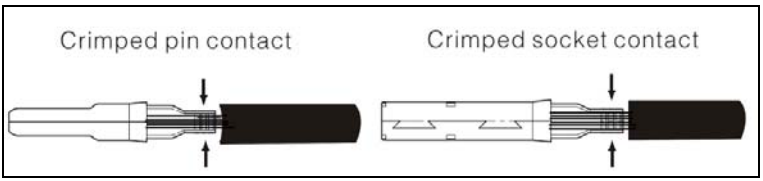
Female side connector (PV+)

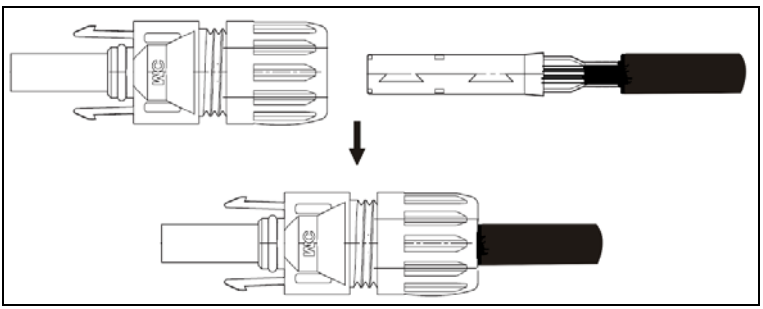


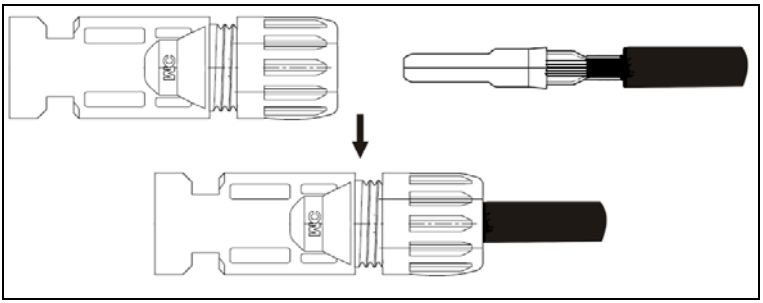
Male side connector (PV-)

Connectors must be installed as a pair, and each cable stripped and installed as shown below.









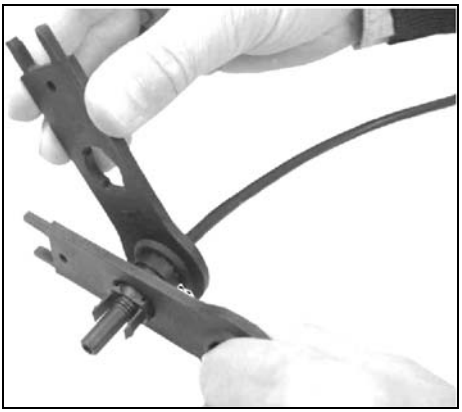


Figure 3.4.2-6

Tighten the screw connection. Then the terminal can be connected to the inverter side.

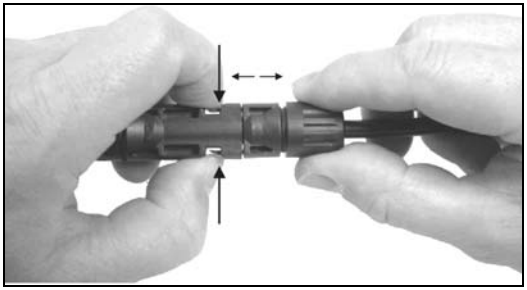


Figure 3.4.2-7
Compress the two snap-in springs by hand and release.

Where the inverter is equipped with a DC switch, ensure the switch is in the "OFF" position before connecting the inverter to PV panels. Switch to "ON" after completing the connection.

- Before connecting the PV panels, ensure the plug connectors have the correct polarity. Incorrect polarity could permanently damage the unit.
- Check the short-circuit current of the PV string. The total short-circuit current must not exceed the inverter’s maximum DC current.
- High voltage exists when the PV panel is exposed to the sun. Secure the terminal connection and, to avoid electric shock, do NOT touch any exposed components.
- PV array should not be connected to the grounding conductor .
- The minimum array insulation resistance to ground that system

designer or installer must meet when selecting the PV panel and system design, based on the minimum value that the design of the PV functional grounding in the inverter was based on. The minimum value of the total resistance 33.3kΩ that the system must meet. There is a risk of shock hazard if the total minimum resistance requirement is not met.

3.4.3 RS485 Communication

An RS485 interface is used for multipoint communication. The EzLogger can monitor and communicate with 50 inverters at the same time; however the cable length should not exceed 1000 m. The diagram below shows a typical inverter connection through the RS485interface.

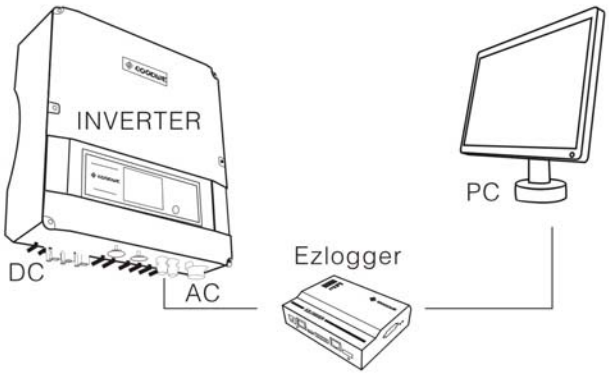


Figure 3.4.3-1

The diagram below shows the inverter connections for multipoint communication through the RS485 interface. “EzExplorer” software at the PC end allows 16 EzLoggers to be monitored simultaneously, in real time.

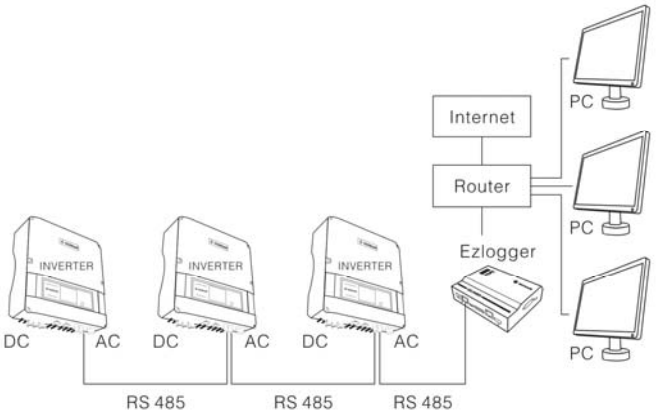
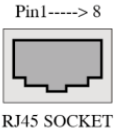


Figure 3.4.3-2

RS485 pins in the GoodWe DS series:

Pin1----- +7V	
Pin2----- +7V	
Pin3----- RX_RS485B	
Pin4-----GND	
Pin5-----GND	
Pin6-----RX_RS485A	
Pin7-----TX_RS485B	
Pin8-----TX_RS485A	

A Connection procedure:

- **a.** Remove the waterproof RS485 cover;
- **b.** Remove the screw cap of the cable gland;
- **c.** Remove the one-hole sealing ring;
- **d.** Put the RS485 cable through the components in this order: screw cap, one-hole sealing ring, gland body;
- **e.** Compress the crystal head and insert it into the corresponding interface;
- **f.** Fasten the waterproof RS485 cover;
- **g.** Fasten the screw cap of the cable gland.

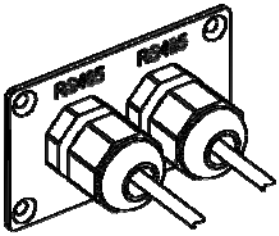


Figure 3.4.3-3

B The RS485 cable has eight wires of different colors. Strip off the outside envelope to expose the eight wires, then straighten the end of each wire, and put them in order.

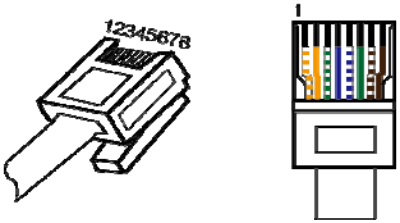


Figure 3.4.3-4

C Ensure each pin of the crystal connection corresponds with the correct wire of the RS485 cable.

D Plug the eight wires into their corresponding slots of the crystal connector, and then fasten them using a 485 wire crimper.

E Connect the other end of the RS485 cable to the crystal connector according to procedures B, C and D

F The inverter can communicate with an EzLogger through an RS485 cable. When the EzLogger is connected to a PC via an Ethernet or USB interface, the inverter can communicate with the PC directly.

3.4.4 ZigBee Communication

Only for ZigBee mode inverter.

Zigbee communication function is not compatible with the 485 communication function.

An EzBee is needed for wireless function. For installation and detailed information of the wireless function please refer to the EzBee User Manual.

A typical wireless connection for an inverter is shown below.

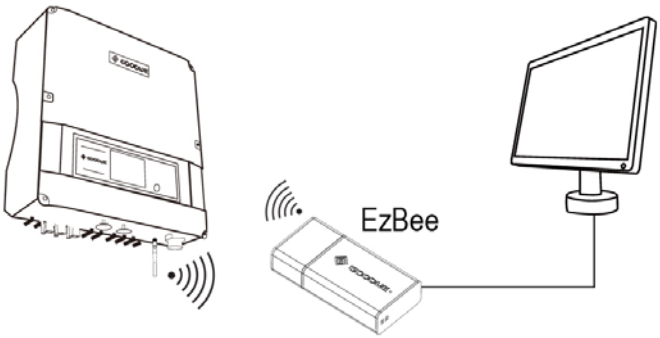


Figure 3.4.4-1

One Ezbee device can monitor up to 50 inverters. The diagram below shows the wireless connection for multiple

inverters.

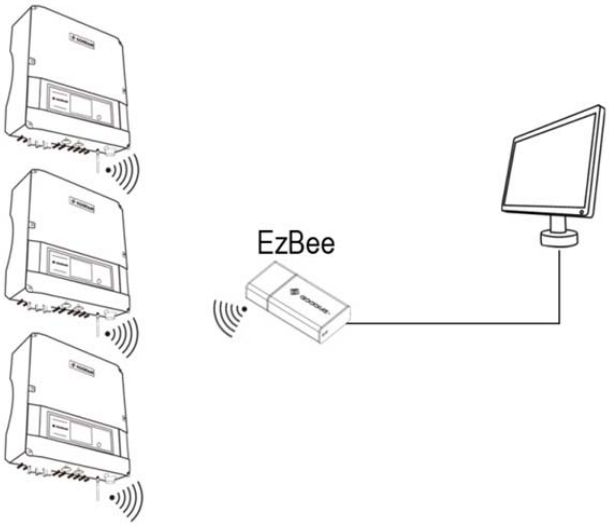


Figure 3.4.4-2

3.4.5 WiFi Communication

You can browse GoodWe global PV stations monitoring website (*http://www.goodwe-power.com*) to get data. The information includes energy generated yearly, monthly and daily, the total income and CO2 savings, etc. At the same time you can browse information of other PV stations if the setting is “shared”.

In order to achieve that you need to register in the website and create your PV station in advance.

A **WiFi** router device is essential for Internet connection. Be sure to keep the inverter in the area that WiFi signal could reach.

ONLY for the inverter with WiFi function:

Step1: Assemble the Antenna.

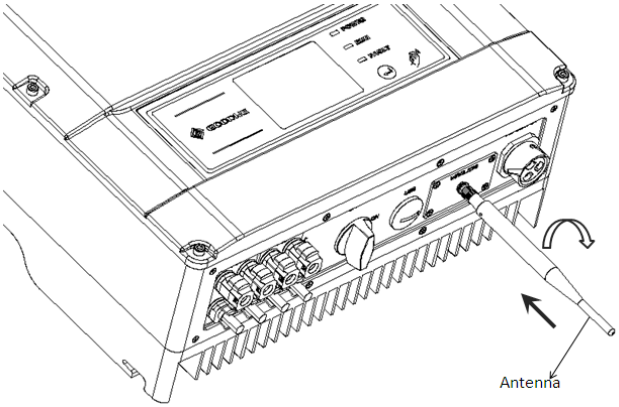


Figure 3.4.5-1

As the picture showed, assemble the antenna into the wireless plate.

Step2: Configuration of Inverter with WiFi

Please start up inverter before the configuration.

You need a PC with WiFi to search WiFi network and choose "GoodWe-HF". Browse website http://10.10.100.254 to set the configuration . A windows page will pop-up after you browse the website, please enter user name and password the same as "admin". In order to avoid the configuration of WiFi module is modified by others, it's recommended that you modify the password of WiFi firstly. To implement it please click "AP Interface Setting". You can find it in the left side of webpage as below.

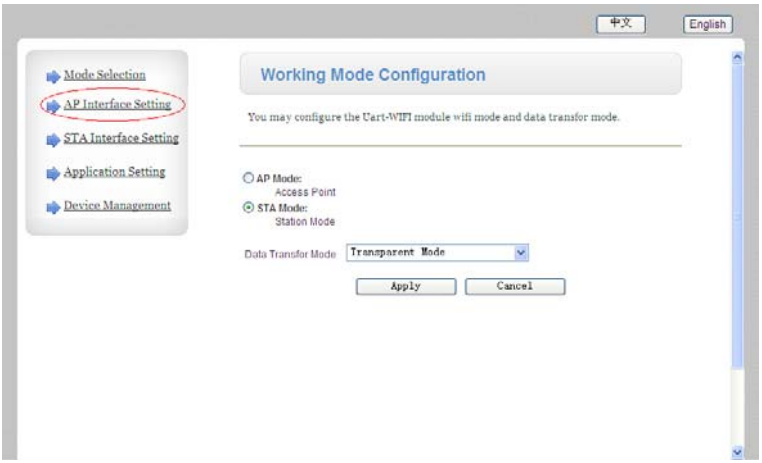


Figure 3.4.5-2

Then you can see a page as below, please change “Security Mode” to “WPA2-PSK” and change WPA Algorithms” to “AES”. Then you can enter the password in “Pass Phrase” column.

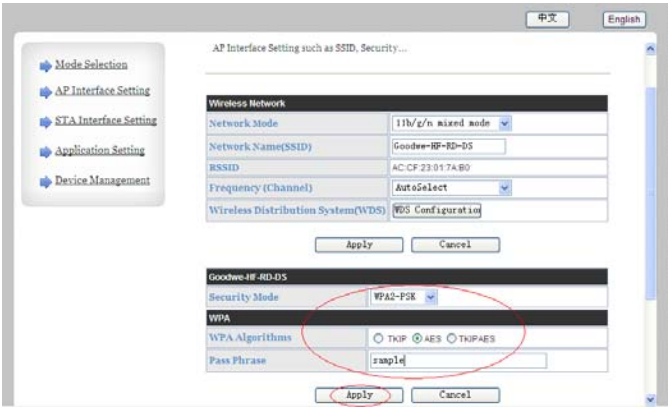


Figure 3.4.5-3

Please don’t change other settings.

NOTICE: Please do remember the password. Once you forget it

and you want to access it, the only way is to reload the WiFi module (Refer to 4.3 Part E) and configure the WiFi module again. After change the password please click “Apply” button, you will get a page as below:

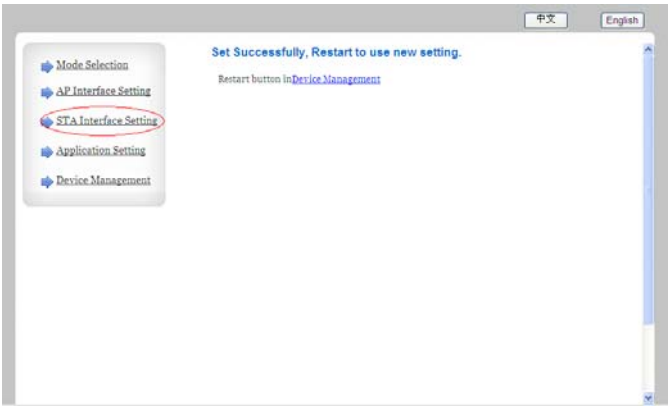


Figure 3.4.5-4

Click “STA Interface Setting” and you will get a page as Figure 3.4.5-5:

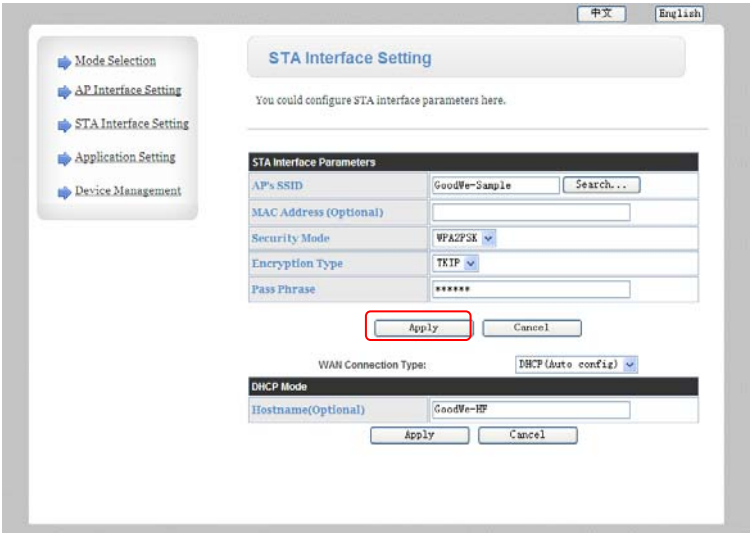


Figure 3.4.5-5

Click “Search…” button, you will get a list of WiFi network and choose the network of your WiFi router. “Security Mode” and “Encryption Type” will change the same as your router automaticly. Enter the password of your WiFi network in “Pass Phrase” column. Do not change the “MAC Address”, “WAN Connection Type” and “Hostname”, then click “Apply” button as shown in picture. You will get a page as below:

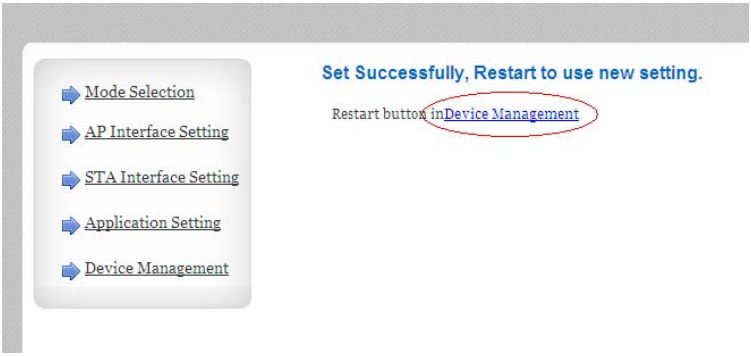


Figure 3.4.5-6

Click the ‘Device Management’, you will get a page as below:

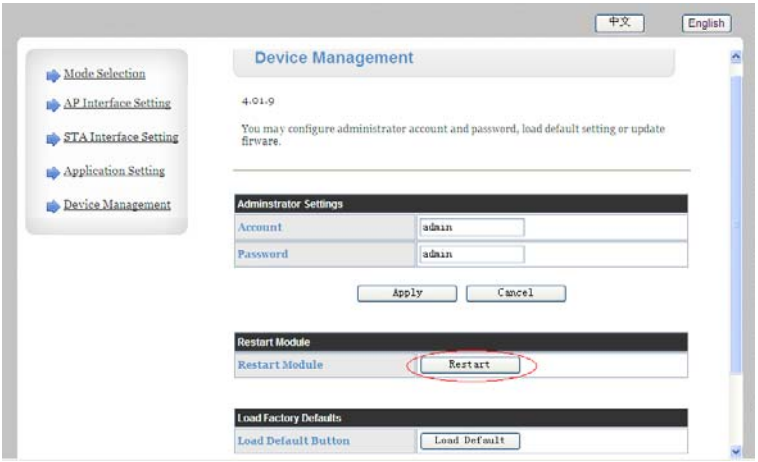


Figure 3.4.5-7

Click the ‘Restart’ button, and several seconds later the configuration is completed. The page will not update automaticly, but you can see the wireless connection disconnect from WiFi module and connect to your local router.

Step3: Registration

After connect to your local router. Browse *http://www.goodwe-power.com*, and click the "Register" button. Select "End User" as user type, fill in the register table and the registration is completed.

Step4: Create PV Station

Fill in the table of the "New Station" web page according to the actual location of your station. In the "Maintain WiFi Inverter" column, enter the information of the inverter including S/N, Check Code, Type and Description, and click "Add" button. Then you can browse the website.

If you have several WiFi type inverters in one PV station, you need to enter their information one by one.

ONLY for non-WiFi type inverter connected with EzLogger

Step1: Get EzLogger

Check the user manual of EzLogger. Follow the steps and ensure your inverters are connected with EzLogger.

Step2:

Registration

Browse http://www.goodwe-power.com, and click the "Register" button.

Select "End User" as user type, fill in the register table and the registration is completed.

Step3: Create PV Station

Fill in the table of the "New Station" web page according to the

actual location of your PV station. In the “Maintain EzLogger/EzMonitor” column, type the information of your EzLogger, including S/N and Check Code. Then click “Add” button. Type the information of your inverter such as S/N, Check Code, Type and Description and click “Add” button. If you got several non-WiFi type inverters for single PV station, you need to type the information of inverter one by one.

NOTICE: ONLY THE DATA FROM INVERTER WITH THOSE INFORMATION ENTERED CORRECTLY IN THE WEBSITE CAN BE VIEWED.

3.4.6 Communication with Solar-Log Device

All GoodWe inverters can be monitored by Solar-Log200/500/1000.

Work steps

• Switch off the inverters and Solar-Log;

• Follow the steps in 3.4.3 connection procedure to install the RS485 interface in the inverters;

• Connect inverters to the Solar-Log;

• Connect the inverters to each other;

CAUTION

Risk of damage to the Solar-Log!

The Solar-Log also has an RJ45 socket, which must never be connected to the RJ45 socket on the inverter!

ONLY connect Solar-Log via the RS485/422 B interface on the bottom of Solar-Log.

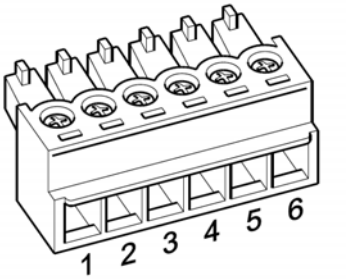


Figure 3.4.6-1

Figure RS485/422 B Terminal Block Connector

Connect the wires as shown in the following diagram:

Solar-Log terminal block connector Terminal	RJ 45 socket of inverter Pin
1	Pin 3
4	Pin 6
5	Pin 1
6	Pin 2

• Insert the RJ45 plug into any RJ45 socket on the first inverter;

• If only one inverter is to be connected, terminate this;

• Insert the terminal block connector into the Solar-Log RS485/422 B socket;

Connecting the inverters to each other

• Connect using a network cable (patch cable);

• Where to connect: RJ45 socket on the outside of the inverter;

Procedure:

• Insert the RJ45 plug into any RJ45 socket on the first inverter;

• Insert the other end of the wire into any RJ45 socket on inverter 2;

• Connect the other inverters to each other in the same way;

• Terminate in the last inverter;

Before operation, please read the instruction of Solar-Log!

3.4.7 USB Communication

USB communication function is available for all GoodWe inverters, Before use the function please install software ‘EzExplorer’ which can be downloaded from GoodWe website.

To connect the USB data cable, remove the USB socket cover and insert the USB cable as indicated.

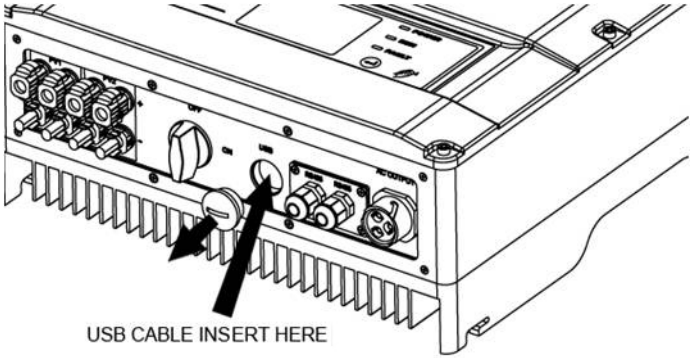


Figure 3.4.7-1

3.5 Troubleshooting

In most situations, the inverter requires very little maintenance. However, if the inverter is not working properly, please try the following troubleshooting solutions before calling your local dealer.

- Should a problem arise, the red (fault) LED indicator on the front panel will light up and the LCD screen will display the type of fault. The following table lists error messages and the solutions for associated faults.

	Display	**Possible actions**
System Fault	Isolation Failure	1. Check the impedance between PV (+) & PV (-) and make sure the PV inverter is earthed. The impedance value must be greater than 2MΩ. 2. Contact the local service office for help if the problem still exists.

	Ground I Failure	1. The ground current is too high. 2. Unplug the inputs from the PV generator and check the peripheral AC system. 3. When the problem is cleared, reconnect the PV panel and check the inverter status. 4. Contact the local service office for help if the problem still exists.
	Vac Failure	1. The PV Inverter will automatically restart within 5 minutes if the grid returns to normal. 2. Make sure grid voltage conforms with the specification. 3. Contact local service office for help if the problem still exists.
	Fac Failure	1. The PV Inverter will automatically restart within 5 minutes if the grid returns to normal. 2. Make sure grid frequency is in conformity with the specification. 3. Contact the local service office for help if the problem still exists.
	Utility Loss	1. Grid is not connected. 2. Check grid connection cables. 3. Check grid usability.
Inverter fault	PV Over Voltage	1. Check whether the PV open voltage is higher or too close to the maximum input voltage. 2. If the problem still exists when the PV voltage is less than the maximum input voltage, contact the local service office for help.
	Consistent Failure	1. Disconnect PV (+) or PV (-) from the input and restart the PV Inverter. 2. If the problem still exists, contact the local service office for help.

	Over Temperature	1. The internal temperature is higher than the normal value specified. 2. Reduce the ambient temperature. 3. Move the inverter to a cool place. 4. If the problem still exists, contact the local service office for help.
	Relay-Check Failure	1. Disconnect all PV (+) or PV (-). 2. Wait for a few seconds. 3. After the LCD switches off, reconnect and check again. 4. If the message appears again, contact the local service office for help.
	DC Injection High	
	EEPROM R/W Failure	
	SCI Failure	
	DC Bus High	
	Ref 2.5V Failure	
	GFCI Failure	

- If there is no display on the panel, check the PV-input connections. If the voltage is higher than 125V, contact the local service office for help.
- When sunlight is insufficient, the PV Inverter may continuously start up and shut down automatically due to insufficient power generated by the PV panel. If the problem remains, please contact the local service office.

4 System Operation

4.1 Display

Figure 4.1-1

4.2 Indicator Lights

- Yellow

For Non-WiFi type

Light on indicates the inverter is electrified;

Light off indicates the inverter is not electrified.

For WiFi type

Light flashes on 1sec off 1sec indicates the WiFi module doesn't connect to the WiFi network; Light flashed on 2.5sec off 2.5sec indicates the WiFi module connect to the WiFi network but cannot send data to Web Server; Always on indicates

communication between Web Server is ok.

- Green

  Light on indicates the inverter is feeding power;

  Light off indicates the inverter is not generating power at the moment.

  Slow flicking (1HZ) indicates the inverter is self-checking;

  Fast flicking (5HZ) indicates the inverter has finished self-checking and is ready for grid integration.

- Red

  Light on indicates abnormal conditions;

  Light off indicates normal condition.

4.3 LCD Display

A A schematic of the display screen is shown below:

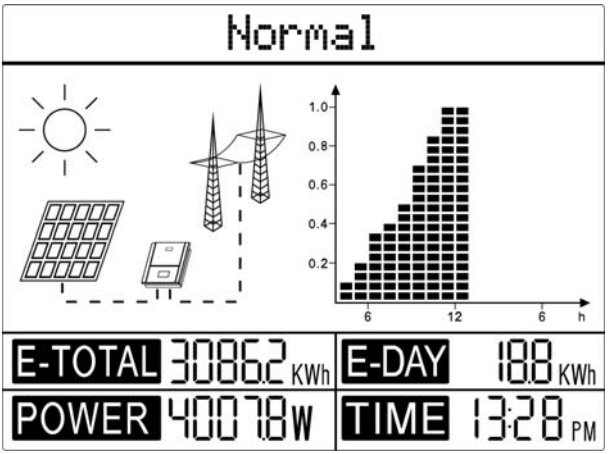


Figure 4.3-1

B Display area

The display area is divided into top, middle and bottom areas.

TOP AREA

- The top area displays the status information.

  "Waiting" indicates the inverter is on standby for power generation;

  "Checking 30S" indicates the inverter is self-checking, counting down and preparing for power generation (checking time is based on safety, and varies from country to country);

  "Normal" indicates the inverter is generating power.

  If any condition of the system is abnormal, the screen will display an error message; please then refer to Table 4.4-1.

- By pressing the key successively, the display in this top area of the screen will scroll through different information, such as operation parameters and power generation status. More guidance on navigating through the menus is given in C to H below.

MIDDLE AREA, LEFT

- The electrical connections on the DC side and the AC side are represented by dashed and full lines.
- A flashing dashed line on DC side indicates the PV panel is feeding power to the inverter.
- Nothing showing on AC side means the grid is not available;
- A full line on the AC side means the grid is available, but the inverter is not generating power ;

- A flashing dashed line on the AC side indicates the inverter is feeding power to the grid network.

MIDDLE AREA, RIGHT

- In this area, a histogram is used to represent the hourly average power generation from 4 a.m. to 8 p.m. for the day. A full column for average power represents the nominal power of system.

BOTTOM AREA

The bottom area displays total power generation, daily power generation, power being generated at present, and time information, as described below.

Part	**Description**
E-TOTAL	Gross power generated from the first use of the inverter. The initial unit is “kWh”; when power generation exceeds 999.9kWh, the unit changes to “MWh”.
E-DAY	Power generated for the day
POWER	Present power generation of the system
TIME	Current system time

About the settings of field adjustable setpoints shall be accessible from communications port.

C Key operation

There are 2 modes of key operation: Short press, Long press for two seconds (2S) .

D Key operation and LCD description

Key operation is mainly for language and time setting; however a variety of other information is also available through key operation.

- The menu, shown in the LCD display area has two levels. Short and long key presses will take you between menus and through each menu, as shown below, in Fig. 4.3-2.

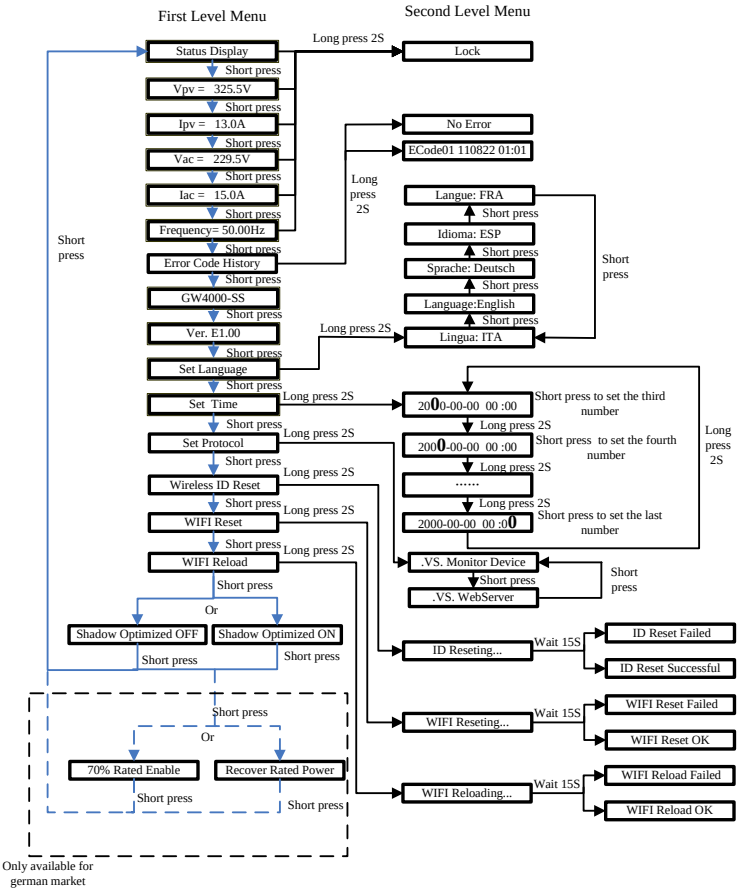


Figure 4.3-2

- Items in the first level menu that have no second level are locked. For these items, when the key is pressed for two seconds, the LCD will display the word “Lock” followed by data relating to the first level menu item. The locked menu can only be unlocked under system mode switching, fault occurrence or key

operation.

- In all levels of menu, if no action is taken for 20 seconds, the backlight of the LCD display will switch off, the display will automatically revert to the first item of the first level menu, and any modifications made to the data will be stored into internal memory.

E Menu Introduction

Status display

Inverter status

When the PV panel is feeding power to the inverter, the screen shows the first-level menu.

- The initial display is the first item of the first level menu, and the interface displays the current status of the system. It shows “Waiting” in the initial state; it shows “Normal” during power generation mode; if there is something wrong with the system, an error message is shown. Please then refer to Table 4.4-1.

View PV voltage, PV current, grid voltage, current and frequency:

- Short press the key to enter the Vpv menu which displays the PV voltage in “V”.
- Short press the key to enter the Ipv menu which displays the PV current in “A”.
- Short press the key to enter the Vac menu which displays the

grid voltage in “V”.

- Short press the key once more to enter the Iac menu which displays the grid current in “A”.
- Short press the key once more to enter the Frequency menu which displays the grid frequency in “Hz”.

View Error code

- Short press the key once more to enter the Error Code History menu.

  Long press (2S) the key to enter the second level menu of error detection. The last three inverter error records will be shown by short pressing the key in this second level menu. The records include error codes (ECODEXX) and error times (e.g. 2011-03-16 15:30). Error codes and their related faults can be found in Table 4.4-2.

View model name and software version:

- From the Error Code History item in the first level menu, short press the key once to see Model Name.
- Short press the key once more to enter the software version menu which shows the current software version used.

Settings:

Set language:

- Short press the button to enter the Set Language menu. Long press (2S) the key to enter the second level menu. Short press to

browse the languages available. The inverter will store the chosen language after 20 seconds of no operation.

Set time:

- From the first level Set Language menu, short press the key to enter the Set Time menu.
- Long press (2S) the key to enter the second level menu. The initial display is “2000-00-00 00:00”, in which the first four numbers represent the year (e.g. 2000~2099); the fifth and sixth numbers represent the month (e.g. 01~12); the seventh and the eighth numbers represent the date (e.g. 01~31). The remaining numbers represent the time.
- Short press to increase the number in current location, and long press to move the cursor to next position. The inverter will store the time after 20 seconds without any key operation, and the LCD will automatically return to the main menu and the backlight will switch off.

Set protocol:

The function is only used for service personnel, set wrong protocol could lead to communication failure.

- From the first level Set Time menu, short press the key once to enters set protocol display menu. Press the key for 2S to enter the second level menu. The circulatory submenu including two protocols can be found. The protocol can be chosen by short

pressing the key. The inverter will store the chosen protocol without any action within 20S and LCD display will automatically return to main menu when the backlight is off.

Reset Zigbee ID:

The function is only available for Zigbee model inverter. When the communication between inverter and EzBee is failed, please try to reset ZigBee ID.

- Press the key until the LCD displays “Zigbee ID Reset”, then Long press (2S) until the LCD displays “ID Resetting …”. Stop pressing and wait for the screen showing “ID Reset Successful” or “ID Reset Failed”.

WiFi Reset & WiFi Reload

The two functions are only available for WiFi model inverters.

WiFi reload function is used to change the WiFi configuration to default value. Please configure the WiFi again as 3.4.5 after using the function.

- Press the key until the LCD displays “WiFi Reset”, then long press (2S) until the LCD displays “WiFi Resetting…”. Stop pressing and wait for the screen showing “WiFi Reset Successful” or “WiFi Reset Failed”.
- Press the key until the LCD displays “WiFi Reload”, then long press (2S) until the LCD displays “WiFi Reloading…”. Stop pressing and wait for the screen showing “WiFi Reload

Successful" or "WiFi Reload Failed".

MPPT function for Shadow:

The default setting for shadow optimizer is disabled.

Please enable shadow optimizer when there is shadow on PV panel. The function could help the system generate more power under shadow condition.

Please do not enable the function when there's no shadow on panel. Otherwise it could lead to generate less power

- Press the key until enter Shadow Optimize menu. When it shows "Shadow Optimized Off", it means the MPPT function for shadow is switched off. Press the key 5s to enable the function. If it shows "Shadow Optimized On" it means the shadow optimizer is on. Press the key 5s to disable the function.

70% Rated power limit

The function could only be available for inverter in German. It could only be used by network operator. Otherwise it will cause the PV plant generated reduced.

- Press the key until enter 70% rated power menu. If it shows "70% Rated Enable" it means the function to limit the inverter working under 70% rated output is switched off. Pressing key 5s will switch this function on. If it shows "Recover Rated Power" it means inverter is working under 70% of rated output power. Press key 5s will recover inverter to 100% of its rated output

power.

F Operation of Display when commissioning.

- When the input voltage reaches the inverter turn-on voltage, the LCD starts to work, the yellow light is on and the LCD displays “Waiting”. More information will be displayed within a few seconds. If the inverter is connected to the grid, “Checking 30” will be displayed and a countdown will commence from 30 seconds. When it shows “00S” you will hear the relay triggered 4 times. The LCD will then display “Normal”. The instant power output will be shown at the left bottom of the LCD.

G Sound Control

Knock at the cover of the inverter, the first level menu can turn from one to another, One knock like one short press on the key. However, it is not possible to enter second-level menu.

H Auto test (only for users in Italy)

- When the inverter is turned on, press the key beside the LCD panel; go to the list of “Auto Test”, long press the key for 2 seconds will take you to “Auto Test Result”. Long press the key for 2 seconds and the auto test history will show on the LCD.
- From “Auto Test Result”, short press the key to go to “Auto Test Start”. Long press (2S) the key for 2 seconds; the interface will show the grid voltage upper intervention thresholds: “Limit

V=276V T=100ms". After 3 seconds the auto test will start. Voltage intervention thresholds vary with a ramp of 0.05Vn/s. The LCD will show the upper limits and trip time after the upper intervention threshold is tripped.

Short press the key to test the grid voltage lower intervention thresholds; the LCD will show "LV=187.0V T=200ms". After 3 seconds the auto test will start. Follow the same steps to finish the upper and lower frequency tests. The frequency intervention thresholds vary with a ramp of 0.05Hz/s.

- During the test, the backlight is always on and the key can't execute any command. After finishing the last item, if 4 auto test items all pass, the inverter will exit the test mode and reconnect to the grid automatically. If the auto test shows a fault, the inverter can't be restored to operating condition until auto test passes.
- In each test item, the result will show as below:

Maximum voltage check
Threshold value
Lim V=276V T=100mS（The limit value will show before starting each test, after 2s the test will start.）
Result
HV=273.0V T= 60ms Y
PASS

Minimum voltage check
Threshold value
Lim V=184V T=200mS
Result
LV=187.0V T=160ms Y
PASS

Maximum frequency check
Threshold value
Lim F=51Hz T=100mS
Result
HF=50.97Hz T=160ms N
FAIL (Example of fail)
Minimum frequency check
Threshold value
Lim F=49Hz T=100mS
Result
LF=49.03Hz T= 60ms Y
PASS

- The test result will be stored in auto test results.

4.4 Error messages

An error message will be displayed on the LCD if a fault occurs.

Table 4.4-1 Description of Error Message

Error message	**Description**
Utility Loss	Grid disconnected
Fac Failure	Grid frequency no longer within permissible range
Consistent Failure	Machine parameter consistent fault
Device Failure	Device internal fault
PV Over Voltage	Overvoltage at DC input
Over Temperature	Overtemperature on the case
Isolation Failure	Ground insulation impedance is too low
Ground I Failure	Overhigh ground leakage current
Relay-Check Failure	Relay self-checking failure

DC Injection High	Overhigh DC injection
EEPROM R/W Failure	Memory chip failure
SCI Failure	Internal communication failure
DC Bus High	Overhigh BUS voltage
Ref 2.5V Failure	2.5V reference voltage failure
AC HCT Failure	Output current sensor failure
GFCI Failure	Detection circuit of ground leakage current failure
Vac Failure	Grid voltage no longer within permissible range

Second level menu error codes

Table 4.4-2 Description of Error Code

Error Code	Description
01	Communication between microcontrollers is failing
02	EEPROM cannot be read or written
03	The master-frequency is out of tolerable range
04	The slave-frequency is out of tolerable range
05	NA
06	NA
07	Relay has failed
08	NA
09	Different value between Master and Slave for grid voltage
10	Different value between Master and Slave for grid frequency
11	NA
12	Different value between Master and Slave for Fac, Uac
13	The DC injection check for grid Current has failed
14	Isolation resistance of PV-plant out of tolerable range

15	Master-grid voltage measurement-value out of tolerable range
16	Fan Lock
17	Pv input voltage is over the tolerable maximum value
18	NA
19	Over temperature fault
20	NA
21	Dc bus fault
22	Ground current is too high
23	Grid voltage =0
24	NA
25	Device Fault
26	Dc Bus voltage is too high.
27	NA
28	Different value between Master and Slave for GFCI
29	Different value between Master and Slave for output DC current
30	The 2.5V DSP reference inside are abnormal
31	The DC output sensor is abnormal
32	The GFCI detecting circuit is abnormal

5 Technical Parameters

Table5.1 GW3600-DS, GW4200-DS,GW4600-DS, GW5000-DS

Model Name	GW3600-DS	GW4200-DS	GW4600-DS	GW5000-DS
DC input data				
Max. PV-generator power [W]	3800	4600	5400	5400
Max. DC Voltage [V]	580	580	580	580
MPPT voltage range [V]	125～550	125～550	125～550	125～550
Turn on DC Voltage [V]	125	125	125	125
Turn off DC Voltage [V]	90	90	90	90
Max. DC work current [A]	2*10	2*15	2*15	2*15
Isc PV [A]	2*15	2*20	2*20	2*20
Max Inverter backfeed current to the array[A]	0	0	0	0
Number of DC connection	4	4	4	4
Number of MPP trackers	2	2	2	2
DC-connection	MC IV Connector			

Standby power consumption [W]	5	5	5	5
Night power consumption [W]	0	0	0	0
Output data				
Nominal AC power	3600W	4200W	4600W	4600W
Max.AC power	3600W	4400W	5100W	5000W
Max.output current[A]	18	21	25	25
Inrush current[A]	0	0	0	0
Max. output fault current［A］	35	35	43	43
Max output overcurrent protection［A］	35	35	43	43
Nominal output voltage range	According to VDE-AR-N4105, RD1699, ENEL,G83, G59, SAA			
AC grid frequency	According to VDE-AR-N 4105, RD1699, ENEL,G83, G59, SAA			
THD(AC output current)	<2%			
Power factor	0.95leading ….0.95lagging			
AC Connector	Single phase with clamps			
Efficiency				
Max. efficiency	97.6%	97.8%	97.8%	97.8%

Euro efficiency	>96.5%	>97.4%	>97.4%	>97.4%
MPPT adaptation efficiency	>99.5%	>99.5%	>99.5%	>99.5%
Safety equipment				
DC reverse polarity protection	Integrated (with diode)			
Leakage current monitoring unit	Integrated			
AC short protection	Integrated			
DC switch-disconnector	Option			
Islanding protection	AFD			
Grid Monitoring	According to VDE-AR-N 4105, VDE 0126-1-1/A1, AS4777.2/.3,RD1699, ENEL,G83/1, G59/2,62109-2			
Normative reference				
EMC compliance	According to EN 61000-6-1,EN 61000-6-2,EN 61000-6-3,EN 61000-6-4			
Safety compliance	According to IEC62109-1, AS3100			
General data				
Dimensions (WxHxD) [mm]	390*417*165			
Net Weight [kg]	20			
Environmental category	outdoor and indoor			

Mounting information	Wall bracket
Operating temperature range	-20～60°C（up 45°C derating）
Relative humidity	0～95%
Site altitude (max.)	2000m
Wet locations classification	4K4H
UV exposure rating	F1
AC Overvoltage category (note2)	Ⅲ
DC Overvoltage category	Ⅱ
IP protection type	IP65
AC Over voltage category	Category III
DC Over voltage category	Category II
Protective Class	Class 1
Topology	Transformerless
Cooling concept	Natural convection
Noise level	<25dB
Display	4’’ LCD
Data communication	USB 2.0; 485(wireless optional)
Standard warranty	5/10/15/20/25(optional)

Table5.2 GW3600D-DK/UK

Model Name	GW3600D-DK/UK
DC input data	
Max. PV-generator power [W]	4200
Max. DC Voltage [V]	580
MPPT voltage range [V]	125～550
Turn on DC Voltage [V]	125
Turn off DC Voltage [V]	90
Max. DC work current [A]	2*10
Max. PV array short current[A]	2*15
Max Inverter backfeed current to the array[A]	0
Number of DC connections	4
Number of MPP trackers	2
DC-connection	MC IV connector
Turn on power [W]	<5
Night Power [W]	0
Output data	
Nominal AC power	3600W
Max.AC power	4000W
Max. output current［A］	16
Inrush current[A]	0
Max. output fault current［A］	35

Max output overcurrent protection［A］	35
Nominal output voltage range	G83/1(For UK); VDE0126-1-1/A1 and EN 50438(For DK)
AC grid frequency	G83/1(For UK); VDE0126-1-1/A1 and EN 50438(For DK)
THD(AC output current)	<2%
Power factor	～1
AC Connector	Single phase with clamps
Efficiency	
Max. efficiency	97.6%
Euro efficiency	>96.5%
MPPT adaptation efficiency	>99.5%
Safety equipment	
DC reverse polarity protection	Integrated (with diode)
Leakage current monitoring unit	Integrated
AC short protection	Integrated
DC switch disconnector	Option
Islanding protection	AFD
Grid Monitoring	G83/1(For UK); VDE0126-1-1/A1 and EN 50438(For DK)
Normative reference	
EMC- compliant according to	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4
Safety compliance	According to IEC62109-1

General data	
Dimensions (WxHxD) [mm]	390*417*165
Net Weight [kg]	18
Environmental category	outdoor and indoor
Mounting information	Wall bracket
Operating temperature range	-20～60°C（up 45°C derating）
Relative humidity	0～95%
Wet locations classification	4K4H
UV exposure rating	F1
AC Overvoltage category (note2)	Ⅲ
DC Overvoltage category	Ⅱ
Site altitude (max.)	2000m
IP protection type	IP65
AC Over voltage category	Category III
DC Over voltage category	Category II
Protective Class	Class 1
Topology	Transformerless
Cooling concept	Natural convection
Noise level	<25dB
Display	4” LCD
Data communication	USB2.0; RS485 (Wireless/Bluetooth optional)
Standard warranty	5/10/15/20/25(optional)

Note: For equipment or circuits energized from the MAINS, four categories are considered:

• category IV applies to equipment permanently connected at the origin of an installation (upstream of the main distribution board). Examples are electricity meters, primaryovercurrent protection equipment and other equipment connected directly to outdooropen lines.Outdoor PCE connected downstream of the main distribution board is not considered OV category IV.

• category III applies to equipment permanently connected in fixed installations(downstream of, and including, the main distribution board). Examples are switchgear and other equipment in an industrial installation;

• category II applies to equipment not permanently connected to the fixed installation.Examples are appliances, portable tools and other plug-connected equipment;

• category I applies to equipment connected to a circuit where measures have been taken to reduce transient overvoltages to a low level.

6 Certificates

7 Warranty

7.1 Warranty Period

GoodWe provides a standard warranty of 5 years for DS series products (warranty period begins from the date on purchase invoice). Additional provision will be subject to contract.

7.2 Warranty Card

The warranty card and purchase invoice should be properly kept for the product warranty period. Meanwhile, the nameplate on products shall be kept clearly visible. Otherwise GoodWe may reject warranty service or only provide paid service.

7.3 Warranty Conditions

According to the GoodWe product description and instructions, if a device becomes defective within the warranty period, and it is proved that further functional performance is impossible due to a problem with product quality, the device will be, as decided by GoodWe:

A Returned to the factory for maintenance; or

B Repaired onsite; or

C Replaced (If the original model is no longer produced, GoodWe will provide a replacement device of equivalent value

according to model and age.

7.4 Scope of Warranty

Warranty is not valid in the following situations:

- Products or fittings exceed warranty period (excluding and warranty extension agreement signed beforehand).
- Fault or damage is caused by improper operation or not following the user manual, product instructions or relevant safety regulations.
- Insufficient ventilation of the unit.
- Fault or damage due to improper installation, repair, change or removal by persons who are not authorized by GoodWe.
- Fault or damage due to unpredictable accidental factors, human errors or force majeure.
- Fault or damage unrelated to product quality.

8 Contact

If you have any enquiries or technical problems concerning a GoodWe DS series inverter, please contact our customer services.

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